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Egyptian Feedlot Practices, Costs, and Returns

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ABSTRACT

A survey of feedlot farms in Egypt shows important variations in operational characteristics, costs, and returns among regions, different sizes of operation, and management systems. Overall, the degree of feedlot utilization was low, less than 70 percent of capacity. Weight gain per day for local breed was lower than for foreign and crossbreeds (1 to 15 percent). Budget analysis showed that the return to average producers covers variable costs and leaves a margin to fixed factors and management, especially for private feedlots. Differences in farm management decisions, on types and weights of animals entering and leaving feedlots, and types of feed ration had a significant effect on costs and returns to farmers.

Keywords: Egypt, feedlots, meat, costs, returns.

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INTRODUCTION

Concern over the growing gap between meat production and consumption has led the Egyptian Government to pursue more research in livestock production and markets. In Egypt, as in most developing countries, livestock data are scarce, meaning that policy decisions relating to the sector have to be made in the absence of complete information.

The Egyptian Government faces the question of how best to fill the meat gap. The increase in cattle feeding in the country has raised questions concerning the competitiveness of local producers, the potential for increasing domestic production, and the overall costs associated with different policy options to increase meat availability.

This report is part of a larger livestock study undertaken by the Egyptian Ministry of Agriculture and the U.S. Department of Agriculture. The overall objective of the project is to look for least-cost alternatives to increase red meat availability in Egypt. This particular report evaluates and quantifies input use, costs, and returns to Egyptian fed beef production under existing conditions and policies.

Feedlot operations in Egypt are mainly privately owned, but the Government directly, by public investment in feedlots, and indirectly, by providing subsidized loans to privately owned operations, encourages increases in meat production. The net return (revenue minus variable costs) has been quite low for publicly managed feedlots, less than one-third that for feedlots in the private sector (according to the survey used in this study), which raises questions about the efficient use of these types of investment. Variations in costs among regions and sizes of operation have been significant.

This report reviews meat market policy and structure to aid the understanding of the current structure of feedlots and practices. Then, the report describes the structural characteristics of the industry. It uses survey data as a basis for evaluating differences in costs and returns among different management systems, regions, sizes of business, and production practices.

REVIEW OF THE MEAT MARKET

Prior to 1974, moderate growth in meat production, combined with slow income growth, resulted in a stable quantity of imports. Imports of meat were

restricted somewhat during 1967-73 because of the financial problems caused by war. During that period, the Government directed its policies toward self-sufficiency in meat production.

Since then, a combination of rapid increase in income (an average of 6 percent annually), population growth (2.8 percent annually), and a strong consumer preference for red meat (income elasticities of demand of about 1.0) put heavy upward pressure on meat prices. In an attempt to slow the increase in prices, the Government increased meat imports. The slow growth in domestic meat production increased the dependency on meat imports to about 30 percent of consumption in the early 1980s. Increasing red meat production has been complicated because local livestock serve as a source of fertilizer and draft power for other crops and consume feed which competes with crop production for limited agricultural land. And, local producers face conflicting government policy signals which limit incentives to produce.

The land constraint represents the major obstacle to agricultural growth. The cultivated area is 5.8 million feddan, 4 percent of Egypt's total area (1 feddan equals 1.038 acres). The entire crop area is irrigated except for some rainfed areas on the Mediterranean coast. Overlapping rotation is the main characteristic of Egypt's agriculture, with crop intensity averaging about 190 (100 represent one crop per year on a given plot of land). With urbanization encroaching on agricultural land, and with increasing demand for food because of population and income growth, the country must import 50 percent of its food. In this environment, the livestock sector has to compete with crop production and is handicapped by the limited domestic supply of feed.

The major constraint facing the meat industry is the shortage of balanced feed rations. Because Egypt has little natural pasture, forage and fodder, as well as feedgrains, must be either produced on irrigated land or be imported. The high cost of land reclamation limits the expansion of irrigated areas and a large, rapidly growing population relative to cultivated area increases the opportunity cost of using land to produce feed.

The most important components of livestock feed are berseem (clover, a winter forage crop), concentrated feed, and roughage (mainly wheat and rice straw, and corn fodder). Berseem competes with the main winter crops, cotton and wheat. During 1960-82, the area of berseem increased from 1.2 to 1.8 million feddan. Total cultivated land area during 1960-82 remained the same and, by some estimates, even decreased slightly. The increase in berseem was then, at the expense of other crops. Aside from green forage, use of concentrated feed mix plays a very important role, especially for fed beef production. Government is the only producer and legal distributor (at subsidized prices) of feed concentrates.

The production formula of feed concentrates was originally based on the use of local crops and byproducts. Cottonseed cake has been the main source of protein feed mix. The Government has imported yellow corn for poultry feed since 1974. Because of the growing demand for livestock feed, yellow corn has been increasingly used as a substitute for cottonseed cake to increase the feed supply. During 1973-83, with an increase in production of feed concentrates, the proportion of cottonseed cake decreased from 65 percent to 35 percent and the proportion of yellow corn increased to 22 percent in concentrate feed distributed by the Government. Feed concentrate production has increased about 13 percent annually since 1970. However, growth in feed mix production is uncertain because cottonseed cake availability is limited by

static cotton production. Additional protein will either have to be imported or produced in competition with other crops.

To stimulate meat production, the Government has been providing feed concentrate at fixed prices, which are substantially lower than international prices (LE 30 per metric ton versus LE 135 in 1983). At the low price, however, the available feed concentrate cannot satisfy demand. The Government, therefore, is allocating the available feed according to a quota system. Excess demand has led to black market trading of feed mix at prices as high as five times the official price, according to a 1983 unpublished official report.

Despite Government's efforts, total red meat produced in Egypt grew at a rate of about 2.6 percent per year during 1966-83, less than the concurrent population growth rate of only 2.8 percent. Lagging production growth and increases in demand put upward pressure on meat prices. In an attempt to slow the price increase, the Government increased imports to a level equivalent to about 30 percent of total red meat consumption during the 1980s.

Most meat imports were in the form of live animals during the 1960s. However, the share of such imports has since declined, going from 71 percent in 1964 to 10 percent in 1980. This decline is attributable to limited feed availability which made meat imports more attractive.

Imports of frozen meat increased tenfold during the last 20 years. Most frozen meat is imported and distributed by the Government. Government-imported frozen red meat is rationed and is not available in most rural areas because of lack of infrastructure for storage and retail marketing. Frozen meat in Egypt is generally considered inferior to fresh meat produced domestically. The price of fresh meat increased sharply by 50 percent during the first half of 1980 because of a combination of an increase in demand, limited availability of fresh meat, and public unhappiness with the low quality of frozen meat. In an effort to prevent further price increases, the Government again expanded live animal imports and began to explore the feasibility of increasing meat availability by expanding feedlot operations (private or public) and/or by increasing imports of high-quality meat and/or live animals for immediate slaughter.

THE FEEDLOT SURVEY

Data used to estimate feedlot production costs and returns were derived from a survey made in 1982-83 of 308 feedlot operators. The sample covered 297 privately owned feedlots, 4 public operations, and 7 farms managed by the private sector but financed through food security loans (called food security feedlots).

Method of Sampling

The sample of privately owned feedlots was based on the Government livestock insurance records. All livestock holders are required by law to insure their animals. These records contain information on the number and types of animals fed. Evidence of insurance establishes the farmer's eligibility to purchase feed concentrate at Government-subsidized prices. Given the large differences between Government and open market feed prices, there is strong incentive for

farmers to insure their cattle. Therefore, insurance records are probably a reliable sample frame.

The sample feedlots were selected by first choosing a sample of governorates (states), then choosing a sample of districts from within these governorates, and finally selecting a sample of feedlots from each sample district. ^{1/} The governorates were selected on the basis of area of clover cultivated and the number of livestock feedlots. Both these criteria reflect the importance of feedlot operations in the governorate. Seven governorates were selected: Beheira, Daquahlea, Sharquea, Kafr El-Sheikh, Ismaelyea, Menoufyeya, and Giza. All governorates, with the exception of Giza, are located in Lower Egypt (northern Egypt). Feedlot operations in these seven governorates represent 49 percent of the total number of feeder cattle placed in feedlots at the national level and 75 percent of those in Lower Egypt. Clover area in these governorates is about 57 percent of the national total and 82 percent of clover area in Lower Egypt.

The governorate of Giza was added as a special case because of the large number of small livestock holders in that governorate. About 97 percent of feedlots in Giza have fewer than 10 head and the Government is concerned with the financial situation and economic efficiency of the small agricultural producers.

The selection of districts was based on the total number of cattle in feedlots and size distribution of operations. Detailed lists of farms by the number of insured livestock were the basis for farm sampling. The total sample size was set at 300 farms because of time and budget constraints. The criteria for farm selection were a combination of number of head and number of farms in each governorate. The sample weights for individual governorates were determined by the proportional distribution of the number of farms and head of animals. The resulting weights for each governorate were: Beheira, 37 percent; Kafr El-Sheikh, 8 percent; Daquahlea, 30 percent; Ismaelyea, 3 percent ^{2/}; and Menoufyeya, 2 percent of the total sample of observations. The final number of private observations was 297 farms.

The Government's concern was to investigate not only costs and returns of fed beef production, but also the relative efficiency of the operations under different ownership; that is, public and private. Since 1973, the Government has been investing in feedlot operations, both through wholly owned and operated public enterprises, and indirectly by providing subsidized loans at 6 percent to private investors. The latter type of operation has been initiated and promoted by the Government in recent years because of concern over the food security issue and the country's increasing dependence on international markets for staple food items. However, Government operations still account for only a small proportion of national meat production. In 1980, about 1.3 percent of total cattle and buffaloes were held in Government feedlots.

^{1/} A complete description of the sampling procedure is available in Arabic. Unpublished paper, Ministry of Agriculture, Cairo, Egypt, 1984.

^{2/} Ismaelyea had lower weight based on our sampling procedure. However, in our sample extra weight was given to Ismaelyea, because of the Government interest (in term of management practice on the newly reclaimed land) to obtain information related to the region.

The large Government investment and the frequent reports of inefficiencies and losses by these types of operations are matters of concern. On the other hand, public feedlot managers were concerned over the method of cost estimation and use of results. Since the responsibility for management of public feedlots in most cases is joint between ministries (Agriculture and Supply), it was possible to persuade only four of the seven public feedlots to participate in the survey.

The questionnaire was designed to obtain data both on prices paid for and physical quantities of inputs used. The costs and returns cover only the feedlot finishing of cattle. Data were gathered based on personal interviews for private feedlots and, in the case of public sector and food security feedlots, on examination of records. A training class for enumerators was conducted prior to the initiation of the survey. Data for each governorate were reviewed by a supervisor. Incomplete questionnaires and those with values outside the expected range were sent back to the enumerators for verification and correction.

Initial tabulation of data was performed manually in Cairo by Ministry staff. Summary data were divided into three sets: data relevant to the budget study, detailed feed data (quantities and values by market sources), and data covering complementary and descriptive information. To speed up the analysis, the summaries of tabulated budget and feed data were computerized in the United States.

Limitations of Data

Survey data used for this report are not a random sample of all livestock producers in Egypt. Therefore, the findings cannot be generalized to represent the costs and returns of feedlots for the whole country. However, they are thought to be reasonably representative of feedlots in Lower Egypt.

The major problem with the survey data is the quality of data for the private sector feedlots. Egyptian farmers in general, and small farmers in particular, do not keep accounting records. Therefore, the reported information is based primarily on recall. Another shortcoming is the reported weight of animals entering and leaving feedlots. With the exception of public food security enterprises and a few large private operations, typical feedlots have no scales. In livestock markets, usually experts visually estimate the weight of the animal and set the prices. These estimates are believed to be reasonably accurate and consistent.

Cost of Production--Practical Considerations

Cost of production statistics have been the focus of substantial public debate in most countries. The reason is the increasing pressure to directly link farm policies to enterprise cost of production levels. Cost of production information is also useful for individual farm management business decisions and farm planning.

The importance of cost estimates for individual farm businesses is to evaluate cost variations under different technologies, scale of operations, and management practices. Cost data can reveal the weaknesses of individual farm managers relative to the average performance in the industry. Policymakers use costs of production to examine existing policies and/or to evaluate the

effects of alternative policies on different types of farm firms. Costs of production are also used by governments for setting input and output prices.

There are limitations to the usefulness of cost of production data for policy decisions. The average cost of the industry may not represent any one individual farmer. If the distribution of costs is approximately normal, about half the observations will be above and about half below the mean cost of production. Users of cost of production data should consider both the mean and range (or variability) of the distribution.

Estimated cost of production can vary significantly depending on different assumptions used either in the reporting process or estimation process. One main area of ambiguity is how to handle imputed costs; that is, costs not observed directly. This type of cost consists of payments for inputs either shared among several production activities (machinery) or for which no payment is made (family labor). Changes in the treatment of imputed costs in the calculation process can have a profound effect on the resulting estimates of costs and returns.

Therefore, cost of production should be used as only one input into any price-setting decisions and as a source of information on costs associated with different farms. To set prices for economic adjustment goals, one should use the idea that quantities and prices are related. If output is not at a satisfactory level and seems likely to remain at that level, then the existing price must not be consistent with the desired output. Knowledge about the components of production cost and its variation can help policymakers direct their policies toward more efficient producers. If the price is based covering the costs of the least efficient producer, the price of the product will increase drastically and "cost" will climb as profits of the efficient producers are capitalized into the durable resources.

Estimation Procedures

The quality of cost estimates depends, first, on the quality of the data and, second, on the method used to allocate joint costs among products and costs of durable assets over time. Production costs associated with an activity can be categorized in the following way:

Observable cash cost: Explicit cash costs of purchased inputs for the production of a specific product. The cost of purchased feeds for livestock is an example.

Imputed direct and indirect costs: Costs associated with inputs used in more than one production activity or for more than one production cycle. An example is the use of general purpose machinery. Though the expenditure is known, the allocation of costs among different products and through time is not known.

Noncash costs: Costs associated with the use of owned factors of production. Own and family labor and farm-produced feed are good examples. No cash is paid for these services. Therefore, assumptions have to be made to attach values in calculation of costs.

No one conceptual basis or computational process is generally accepted over another in calculating imputed cost and in particular noncash costs. Some

methods give reasonable results on specialized farms while others are better in estimating the costs for nonspecialized farms.

Implications for this Study

In order to estimate shortrun average costs of a farm, costs must be classified as fixed and variable, corresponding to fixed and variable resources. Table 1 shows the summary of possible classifications of the inputs and costs relevant to feedlot operations.

Table 1--Classification of costs

Inputs	Type of costs	Type of payments
Feeder cattle	Variable	Cash or noncash
Feed costs	Variable	Cash or noncash
Veterinary and medicine	Variable	Cash
Marketing	Variable	Cash
Hired labor	Variable	Cash
Miscellaneous expense	Variable	Cash
Family labor	Variable	Imputed
Owned land	Fixed	Imputed
Machinery	Fixed	Imputed cash
Buildings	Fixed	Imputed cash

This study focuses on variable costs, which vary with the scale of operation. Permanent labor could be included as a fixed cost (this is mainly relevant for the public sector operations). As an imputed variable cost, family labor, frequently used in Egyptian farming systems, requires special attention to avoid arbitrary imputation. The information provided by the farmers (as the wage paid or assigned) was used in calculating cost. These reported labor costs may or may not be consistent with the average cash wages paid in the region.

The fixed costs, either imputed cash (machinery and buildings) or imputed noncash (land), represented special problems, because of the substantial differences in the technologies and facilities used by the farmers. In most cases, farmers' responses to questions about fixed costs were the estimate of their total farm assets which often included other farming activities as well as livestock. The nonspecialized nature of farm management, even among larger farms, is quite common. The specialized livestock producer, by Egyptian standards, is one who produces fed beef and dairy products, and sells feeder cattle. Among small farmers (those with fewer than six head of animals), the interpretation of the fixed asset statistic is even more complicated. For example, the reported purchase value of a shelter or building to keep three animals varies from LE 15 to LE 3,000, which, in the latter case, probably includes the value of the farmhouse.

The value of land varies significantly among farmers even within one region (district) because of land speculation, government regulation of rent, and the fact that many landlords seek to avoid rent restrictions. USDA cost of

production studies have used several methods in imputing a land charge, including: (1) interest on current value of land, (2) interest on land at acquisition value, (3) cash rent, and (4) a combination of 1 and 3, weighted on the basis of land tenure. Variations in the method of estimation change the results, which may or may not truly reflect the economic condition of the subsector.

This study, to avoid introducing large biases, defines the net return or return to management and fixed costs as the residual from the subtraction of variable costs from total revenue. This procedure probably will not change the relationship between costs and returns significantly, because of the expected low contribution of the fixed costs in overall operating costs of feedlots (the exceptions are public sector feedlots). In the United States, with more advanced production techniques than Egypt, fixed costs represented less than 4 percent of total costs of fed beef producers in 1980 through 1982. Only fixed costs for public farms are calculated separately because of the Government's concern over the efficiency and costs of this specific subsector.

All calculated costs and returns are based on prevailing prices, whether market prices or subsidized prices. Removal of the Government's feed subsidy policy would change the findings significantly. The effects of changing government policies are incorporated in the final section of the study to evaluate economic costs and returns to different types of producers.

The budgets are based on farmers' responses, and may be either actual cash costs paid for purchased inputs or estimates of farm-produced inputs. Farmers may tend to overstate the value of farm-produced inputs and consequently, depending on the proportion of total variable costs constituted by onfarm production, some upward biases could be expected in the results.

SAMPLE CHARACTERISTICS

Survey of cattle-feeding are summarized by different management systems, regions, and size of the operations. Government policies have had a major role in shaping the overall feedlot structure, especially in the area of management practices by private, public, and food security lots.

Size of Enterprise

Private feeding operations vary from 1 to 360 head, with a small number of large feedlots dominating fed beef production. Only 4 percent of the private feedlots had a capacity of more than 50 head, yet these farmers marketed 16.2 percent of the total fed beef production (table 2). Small feedlots with 10 or fewer head of animals constituted about 74 percent of total farms, but marketed less than 13 percent of fed beef. For these small producers, the beef feeding enterprise frequently is supplementary to the total farm business, with the size of the feeding operation depending on availability of farm-produced feed. In many instances, small beef breeding herds on the farm provide the feeder calves that are fattened.

Public sector and food security feedlots made up 3.8 percent of the total number of operations in the sample, but marketed 61 percent of fed beef production. The large contribution of the public sector to meat production is due to the large average size of feedlots in this sector and the much higher sampling percentage for these types of feedlots. The average size of the

private feedlots was about 14 head, while in food security and public enterprises the average number of head was 412 and 888, respectively.

Locational Differences

Seven governorates are included in the study of private feedlots, and all but one are located in Lower Egypt. Beheira, Ismaelyea, Kafr El-Sheikh, Daquahlea, Sharquea, and Menoufyeya are in Lower Egypt. Giza is in Middle Egypt. The average size of feedlots varies within and among governorates, with Giza having the largest private feedlot at 360 (table 3). Average size of feedlots was highest in Menoufyeya, 61 head, and lowest in Daquahlea, 7 head. Giza and Menoufyeya are the closest to Cairo, the major market for meat in the country. This could explain the greater concentration of larger feedlots in these two governorates.

Because of transportation problems and the increasing demand for fresh meat, a significant geographical shift (toward areas closer to the major market) combined with increasing size of feedlots could be expected. Some evidence of this can be seen in our data (table 4). Beheira and Daquahlea had the largest number of observations, 87 and 80, respectively. Daquahlea is not close to a major meat market and therefore, most sample operations, 91 percent, were small with 10 head or less. In contrast, in Beheira which is close to Alexandria (second largest city after Cairo), 63 percent were small farms, but this governorate accounted for 40 percent of the largest feedlots (over 50 head) in the entire sample.

Utilization of Feedlots

Utilization of feedlot facilities is measured by the "turnover ratio" or the annual number of cattle fed divided by the one time feedlot capacity (table 5). The degree of feedlot utilization among sample feedlots varies by region and type of ownership. The turnover ratio (annual numbers of cattle fed divided by one time feedlot capacity) ranges from 0.50 to 0.94 percent among private farms. The average rate of utilization is lowest in food security feedlots, 0.36 percent, but 0.68 and 0.64, respectively for private and public. Possible reasons for underutilization of feedlots are shortages of feed and to a lesser extent feeder cattle. The general consensus among researchers and farmers is that the shortage of feed, especially during the summer period, is the most important constraint facing the meat industry.

Every year, several thousand calves are slaughtered without finishing. In addition, the average mortality rate for local calves (less than 1 year) is high. The average mortality rate for buffalo calves is 17 percent and 5 percent for cow calves. The combination of feed and feeder calf shortages leaves more than 50 percent of feedlot capacities unutilized. For the majority of farmers, 80 percent of the total sample, the feedlot is used for only one cycle per year. Cattle are placed on feed for periods ranging from 4-8 months. The 6-month feeding period is by far the most common (91 percent of sample) and only 6 percent of the farmers reported longer feeding periods, with 8 months being the longest reported.

This low level of utilization of facilities raises the question of how farmers can afford to stay in the business. The most likely explanation is the low level of investment in buildings and equipment and multiple use of the facilities for other farming activities, especially by small farms. The type of facilities ranges from keeping livestock in the backyard (with sometimes a

fence around the feedlot with feed put on the ground) to modern facilities comparable with those in the United States.

Table 2--Cattle distribution by management system and size,
within the sample

Management system and size	: : Number : of farms :	: Farms : per class :	: Avg. head : per farm :	: No. of head : per class :	: Head : per class
Private:	: : <u>No.</u>	: <u>Pct</u>	: : ----- <u>Number</u> -----	: <u>Pct.</u>	
1-3 head	: 60	: 19.5	: 2.7	: 162	: 1.5
4-6 head	: 105	: 34.1	: 4.9	: 517	: 4.9
7-10 head	: 63	: 20.5	: 8.6	: 548	: 5.2
11-20 head	: 40	: 13.0	: 15.4	: 618	: 5.9
21-30 head	: 9	: 2.9	: 26.8	: 242	: 2.3
31-50 head	: 7	: 2.3	: 41.8	: 293	: 2.8
More than 50 head	: 13	: 4.2	: 131.4	: 1,709	: 16.2
Subtotal/average	: 297	: 96.4	: 13.5	: 4,033	: 38.5
Public sector	: 4	: 1.3	: 887.7	: 3,551	: 33.9
Food security	: 7	: 2.3	: 412.4	: 2,887	: 27.6
Total	: 308	: 100.0		: 10,771	

Table 3--Size of operation by governorate (private only),
within the sample

Governorate	: : Farms :	: : Average head : per farm :	: Minimum : number : of head :	: Maximum : number : of head :
	: : <u>Number</u>			
Beheira	: 87	: 15.5	: 3	: 100
Ismaelyea	: 15	: 9.2	: 1	: 30
Kafr El-Sheikh	: 25	: 7.5	: 1	: 60
Daquahlea	: 80	: 7.1	: 2	: 72
Sharquea	: 55	: 12.3	: 3	: 176
Menoufyea	: 10	: 60.9	: 5	: 300
Giza	: 25	: 21.8	: 1	: 360
Total/average	: 297	: 13.5	: 1	: 360

Table 4--Distribution of sample, private-sector feedlots
by herd size and governorate

Governorate	Head							
	1-3	4-6	7-10	11-20	20-30	31-50	More than 50	Total
	:	:	:	:	:	:	:	:
Beheira	1	26	24	22	3	6	5	87
Ismaelyea	4	3	5	1	2	0	0	15
Kafr El-Sheikh	9	5	10	0	0	0	1	25
Daquahlea	23	40	10	4	1	0	2	80
Sharquea	17	22	5	8	1	0	2	55
Menoufyea	0	2	2	1	2	1	2	10
Giza	6	7	7	4	0	0	1	25
Total	60	105	63	40	9	7	13	297

Table 5--Sample feedlot utilization and capacity

Management system and governorate	Average number of head in feedlot:	Average capacity of feedlot	Turnover ratio <u>1/</u>
Private:			
Beheira	16	18	.89
Ismaelyea	9	18	.50
Kafr El-Sheikh	8	13	.62
Daquahlea	7	13	.50
Sharquea	12	24	.50
Menoufyea	60	64	.94
Giza	22	30	.73
Average	14.6	20	.68
Food security	326	908	.36
Public sector	887	1,388	.64

1/ The ratio of annual number of cattle fed divided by the one time feedlot capacity.

Types of Animals

Within the feedlot sector there is a wide variety of types of animals fed. Animals vary by age, sex, breed, and weight. In most of the farms, local breeds are placed in feedlots, and are either cattle or buffaloes (table 6). The common practice for most farmers is to feed only one type of animal, either local, foreign, or crossbreed. The mixture of different types of animals in one feedlot is reported by only 2 percent of the farmers. In the private sector, 95 percent of feedlots reported feeding of local breeds. Only three farms were specialized in feeding foreign breeds and seven farms fed a mixture of different breeds.

Most food security farms also feed domestic breeds. Of the public farms, with easier access to imports, two specialized in fattening foreign breeds and the other two fed only local and crossbreeds.

Weight Gain

The quantity of fed beef marketed from a given number of feeder animals depends upon initial weight, weight gain per day, and days on feed. The average weight of animals entering and marketed exhibited some variations among the regions and between different types of animals (table 7). The average weight of animals entering feedlots ranged among governorates from 204 kg to 270 kg for local breeds, from 220 to 280 kg for foreign breeds, and from 200 to 330 kg for crossbreeds. The corresponding marketed weight was lowest for the local breeds, 410 kg on the average, and ranged between 381 to 450 kg. Average marketed weight was the highest for crossbreeds, averaging 492 kg and ranging from 350 to 600 kg.

The average weight of feeder animals entering U.S. commercial feedlots under normal conditions is about 290-295 kg for steers and 260-265 kg for feeder heifers, which is 10 to 15 percent higher than for Egypt. Similarly, the average marketed weight for U.S. steers is from 455 to 545 kg and for heifers from 383-455 kg, also 10 to 15 percent higher than in Egypt.

A variety of factors influence rate of gain over time and among regions. Some of the more important factors include weight and condition of cattle entering feedlots, ration composition (faster gains usually result from rations with a higher percentage of concentrate), sex of cattle (steers normally gain faster than heifers), and weather conditions (extremely hot, cold, wet, or muddy conditions depress weight gain). Length of the feeding period is also interrelated with rate of gain, weight of animals entering feedlots, ration composition, and marketed weight.

The feeding period was longest in the public sector feedlots, 208 days, and shortest in food security feedlots, 159 days (table 8). The range of average gains per day among types of animals was from 0.75 (local breed in Beheira) to 1.35 kg per day (cross breed in Daquahlea). Gain per day for local breed was highest for public lots and lowest for private feedlots. Daily gain in the food security lots was intermediate. Public sector farms have better access to feed concentrates, while private farms have to rely on a higher percentage of roughage and forage in rations. This seems to be the major factor explaining lower daily gains in the private lots.

The average daily gain for steers, under normal conditions in the United States, is about 1.32 kg and for heifers 1.11 kg, which is very close to the

Table 6--Type of animal by management system and governorate

Management system and governorate	Domestic breed			Foreign breed			Crossbreed			Mixture of the three		
	Farms	Percent : of total :	:	Farms	Percent : of total :	:	Farms	Percent : of total :	:	Farms	Percent : of total :	:
	Number	Percent		Number	Percent		Number	Percent		Number	Percent	
Private:												
Beheira	78	90		--	--		5	--		4	--	
Ismailyea	15	100		--	--		--	--		--	--	
Kafr El-Sheikh:	23	92		--	--		--	--		2	8	
Daquahlea	79	99		1	1		--	--		--	--	
Sharquea	55	100		--	--		--	--		--	--	
Menoufyea	8	80		1	10		--	--		1	10	
Giza	24	96		1	4		--	--		--	--	
Subtotal/Avg.	282	95		3	1		5	2		7	2	
Food security	6	86		--	--		1	14		--	--	
Public sector	2	50		2	50		--	--		--	--	
Total/Avg.	290	94		5	2		6	2		7	2	

-- = Not applicable

range of average gain in Egypt, especially for foreign and crossbreeds. The marketed weight of fed beef, in addition to the factors discussed above, also depends on prevailing market prices for meat and feed. There is a tendency in the United States to feed cattle to a heavier weight when meat prices are high relative to feed prices, while low price leads to sales of lighter weight animals as producers attempt a rapid turnover to maximize profits. In Egypt, the impact of cost push, because of feed shortages, is thought to be the main factor forcing the private farmers to sell their cattle at lighter weights. Again, this is similar to the pattern in Arizona and California where the transportation cost to bring in grain forces farmers to sell their cattle at lighter weight.

PRODUCTION COSTS

Enterprise budgets (average variable costs) are constructed in this section for the total sample, for each type of feedlot by ownership (private, public, and food security), and for private sector feedlots by location and size of operation. Unit costs are presented per head of animals purchased, and per kg of gain produced in the feedlots. To aid comparison of costs among types of operations and regions, this section presents all variable costs (excluding purchase expenses of feeder cattle) as operating costs. Then the purchase values of feeder cattle are added to derive the estimate of total variable costs. These comparisons do not necessarily measure relative economic efficiency, since price distortions are included. A later section compares costs after adjustment for feed subsidies and price restrictions applicable to sale of finished animals by public feedlots.

Table 7--Average weight of animal by type

Management system and governorate	Domestic breed		Foreign breed		Crossbreed	
	Entering	Marketed	Entering	Marketed	Entering	Marketed
	feedlots	:	feedlots	:	feedlots	:
	:	:	:	:	:	:
	<u>Kg</u>					
Private:						
Beheira	270	405	--	--	258	450
Ismaelyea	204	384	--	--	--	--
Kafr El-Sheikh	214	385	225	415	--	--
Daquahlea	209	425	250	500	--	--
Sharquea	238	431	--	--	--	--
Menoufyea	209	390	220	460	300	500
Giza	208	381	250	440	--	--
Average	233	409	236	449	279	475
Food security	251	420	--	--	200	350
Public sector	225	450	280	550	330	600
Average	232	410	258	489	274	492

-- = Not applicable

Table 8--Average weight gain by type

Governorate	Average : production : period	Domestic breed			Foreign breed			Crossbreed		
		Fattening : period	Gain : per day	Days	Fattening : period	Gain : per day	Days	Fattening : period	Gain : per day	Days
		-----Days-----	Kg	Days	Kg	Days	Kg	Days	Kg	Days
Private:										
Beheira	180	135	.75	--	--	--	--	192	1.07	--
Ismaelyea	180	180	1.00	--	--	--	--	--	--	--
Kafr El-Sheikh:	182	171	.94	190	1.04	--	--	--	--	--
Daquahlea	185	216	1.17	250	1.35	--	--	--	--	--
Sharquea	184	192	1.04	--	--	--	--	--	--	--
Menoufyea	185	181	.98	240	1.30	200	1.08	200	1.08	--
Giza	178	179	.97	190	1.07	--	--	--	--	--
Average	182	176	.97	218	1.20	196	1.08	196	1.08	--
Food security	159	196	1.06	--	--	--	--	150	.99	--
Public sector	208	225	1.11	270	1.29	270	1.29	270	1.29	--
Average	182	178	.98	231	1.21	218	1.20	218	1.20	--
-- = Not applicable										

The relative importance of the various cost items in fed-beef production is shown in table 9. Total variable costs, which include operating costs plus purchase of the feeder cattle, comprise most of the enterprise costs. The largest direct costs were expenditures for feeder cattle and feed, which together accounted for 90 percent, 96 percent, and 95 percent, respectively, for private, food security, and public farms. Other direct costs were smaller for public and food security than for private farmer feedlots.

Operating Costs

The main components of operating costs are feed, labor, bedding, insurance, veterinary services, and other variable costs including transportation, water, fuel, electricity, and repairs.

Feed costs--There is a significant variation in the types of animals fed, but the types of rations are more homogeneous and can be divided into two distinct ration systems. One typical ration system uses a combination of three different types of feed: green forage, concentrated feed, and roughage. The second type of ration includes only concentrated feed and roughage. As shown in tables 9 to 11, the share of the different types of feed constituting total feed costs varies among different management systems, regions, and size of operation in the private sector.

Feed is generally the major cost item, accounting for 71 percent of total operating costs for the sample. Total feed costs per head were lowest for food security farms, LE 64 per head, and highest on the private farms, LE 143 (table 9). Feed costs per kg of gain were lowest for public farms, slightly higher for food security farms, and highest for private farms.

Unit feed cost of private farms was more than twice the feed costs of the public farms. The main reasons for such a variation in feed cost are differences in the types of rations fed and the prices paid for feedstuffs. Public sector and food security farms rely on subsidized feed concentrates more heavily than do private farms. In public and food security farms, 59 and 49 percent, respectively, of feed expenses private farms were for feed concentrates, while concentrates on private farms were 39 percent of total feed cost. Feed concentrates are heavily subsidized and rationed. However, in practice the allocation procedure gives priority to public farms, which leaves less than the needed level of feed distributed among private farms. Supplemental nutritional needs for private feeding are acquired by purchasing quantities of concentrate feed from the black market (resale of government distributed subsidized feed concentrate at market price) or using rations with higher roughage and/or green forage content. The black market price for feed concentrates was as high as six times the official price--LE 180 versus LE 30 per ton in 1983. Any purchase of feed concentrate on the black market, therefore, can significantly increase feeding costs. When farmers use more roughage or green forage to substitute for concentrate, the result is more kg of feed required per kg of weight gain.

The combination of the above factors led to higher feed costs for private sector feedlots, without regard to location or size. Within the private sector, there were also variations in the share of different types of feed in total feed costs according to size and location. Total feed cost per kg of gain was lowest in Sharquea and Daquahlea, and highest in Beheira (table 10).

Table 9--Feedlot budget by management system

Item	Private		Public sector		Food security	
	Per head	:Per kg of gain:	Per head	:Per kg of gain:	Per head	:Per kg of gain
<u>LE</u>						
Revenue	736.45	4.26	650.05	2.36	678.29	4.01
Purchase cost of feeder	383.33	2.24	428.36	1.56	423.96	2.51
Feed costs:						
Green forage	27.49	.15	10.48	.04	5.74	.03
Concentrate	55.12	.34	54.62	.18	31.65	.20
Roughage	60.61	.35	28.02	.10	26.86	.16
Subtotal/Avg.	143.22	.84	93.12	.32	64.25	.39
Nonfeed operating costs:						
Bedding	9.38	.05	1.84	.01	0.98	.01
Labor	39.86	.23	15.75	.05	10.88	.08
Insurance	2.55	.02	0		2.28	.01
Veterinary	3.97	.02	6.47	.02	3.49	.02
Other costs	4.03	.02	5.74	.02	1.62	.01
Subtotal/Avg.	59.79	.34	29.80	.10	19.25	.13
Operating costs	203.02	1.18	122.93	.42	83.49	.52
Variable costs	586.35	3.42	551.28	1.98	507.45	3.03
Net return	150.10	.84	98.77	.38	170.84	.98

Table 10--Components of feed cost by governorate, private feedlots

Governorate	Green forage Per head : Per kg of gain :	Feed concentrate Per head : Per kg of gain :	Pouchoane Per head : Per kg of gain :	Total feed cost. Per head : Per kg of :
Beheira	15.36	.86.99 .62	70.03	172.38
Ismailyea	23.01	.67.27 .40	49.92	140.20
Kafr El-Sheikh	22.4	.49.66 .30	53.49	125.55
Daquahlea	37.31	.30.63 .14	62.85	130.80
Sharquea	31.76	.42.79 .23	46.15	120.70
Menoufyea	27.92	.62.25 .30	68.38	158.54
Giza	36.48	.45.02 .25	62.88	144.38

Examination of the feed cost on private feedlots by size of operation (table 11) indicates that feed cost was lowest for the smallest (1-3 head) and largest (more than 50 head) size of the operations (LE 0.65 and LE 0.75 per kg of weight gain, respectively). The probable explanation is the use of residual farm products as feed in small farms. In smaller feedlots, supplements to feed concentrates, green forage, and/or roughage are produced on the farm, which is expected to be less expensive than if they were purchased from the market. The larger private feedlots, like public and food security lots, are given priority in terms of receiving feed concentrates, which explains their relatively lower feed costs.

Labor costs--Labor was the second most important variable cost item, representing an average of almost 19 percent of total operating costs. Labor costs were higher for private feedlots, especially the smaller ones (tables 9, 12, and 13). Lower labor costs in the larger lots are partially due to a higher degree of labor specialization and more intensive use of mechanized equipment. Smaller feedlots generally use less specialized power equipment than do large feedlots, and individual assignments in small lots often include a variety of jobs, in contrast to the more specialized labor structure in the larger feedlots. Small farms are more likely to overestimate labor requirements because of the diversified nature of their farming operations. These same factors may explain the lower labor cost in public and food security feed lots since they are larger and more specialized than private lots.

Comparisons of regional differences in labor costs showed large variations in labor costs among different governorates (table 12). Labor costs were lowest in Beheira (LE 32 per head) and Daquahlea (LE 30 per head), representing 14 percent and 16 percent of operating costs, respectively. Giza's cost of labor per head of livestock was the highest, LE 62, representing 27 percent of the total operating cost. Giza's is the governorate closest to Cairo, creating for a higher opportunity cost of farm labor.

Other operating costs--Other major items of variable costs are bedding, veterinary services, insurance, and costs such as transportation, repair, and fuel which accounted for smaller proportions of the total feeding costs (tables 9, 12, and 13). Cost of bedding was significantly higher for private farms (LE 9 per head) than for public (LE 2) and food security (LE 1.2) farms. The reason for the high bedding costs of private farms is the general layout of their shelter facilities and revenue derived from manure. Livestock are kept in an open lot and pens are of dirt, straw, or dust which are purchased. Cattle wastes, along with bedding, especially straw, have value as fertilizer for crops. In public and food security farms, smaller quantities of dirt are used, while private farms, to get a larger quantity of fertilizer to sell, use larger quantities of dirt to mix with manure. In all cases, values accruing to the cattle feeding enterprise from sale of manure are treated as a credit in estimating revenue of feedlot operations.

Veterinary costs were higher for public farms than for food security and private farms (table 13). Veterinary costs as a share of total operating costs ranged from 2 percent in private feedlots to 5 percent in public lots. In private farms, veterinary costs increase with the size of operation. Public feedlots and some of the larger private feedlots often retain personnel such as trained veterinarians or practical veterinarians who are capable of providing medication and other necessary aid when needed, resulting higher veterinary costs.

Table 11--Components of feed cost by management system and size

Management system and size	Green forage		Feed concentrate		Roughage		Total feed cost	
	Per head	: Per kg : of gain	Per head	: Per kg : of gain	Per head	: Per kg : of gain	Per head	: Per kg : of gain
<u>LE</u>								
Private:								
1-3 head	36.36	0.19	39.70	0.21	46.14	0.25	122.20	0.65
4-6 head	30.57	.16	47.91	.28	60.06	.34	138.53	.78
7-10 head	26.99	.16	67.97	.44	69.36	.40	164.31	1.00
11-20 head	16.00	.10	65.32	.44	65.58	.43	146.89	.97
21-30 head	18.10	.11	63.97	.40	71.59	.44	153.66	.95
31-50 head	6.33	.04	98.46	.55	61.53	.36	166.32	.94
More than 50 head	17.37	.09	61.55	.32	66.02	.34	144.95	.75
Average	27.49	.15	55.12	.34	60.61	.35	143.22	.84
Public sector	10.48	.04	54.62	.18	28.02	.10	93.12	.32
Food security	5.74	.03	31.65	.20	26.86	.10	64.25	.39

Insurance costs were about 1.3 percent and 2.3 percent of the total operating costs for private and food security feedlots, respectively. The average insurance expense paid was LE 2.5 per head. No insurance payment was reported by public lots. Insurance premiums are paid to the Government's agents and the fee is fixed on a per-head basis.

Other operating costs were less than LE 6 per head (table 13). The overall contribution of this type of costs was about 2 percent of the total operating costs.

Fixed Costs in Public Lots

Because of the Government's special concern over the economic efficiency of the public lots and poor data for private and food security operations, fixed costs were estimated for public sector feedlots only. Bookkeeping is standardized in public farms and data are sufficient for fixed cost estimation purpose. The annual fixed costs included in this part are land costs and depreciation on durable assets. The summary of assumptions as to calculated fixed costs are as follows: 3/

1. Land cost is based on the rental value of land, fixed by the Government.
2. Depreciation on buildings is calculated by the straightline method, assuming a 30-year life.
3. The depreciation period for machinery and other facilities such as electrical and water systems is 10 years.
4. Furniture (office) is depreciated over 15 years.
5. The life expectancy of draft animals is 15 years.

Calculated fixed costs ranged from LE 3 per head to LE 9 per head, 5 to 7 percent of the operating costs, among the public sector lots. Of course, any changes in the assumptions could change the results and the proportion of fixed cost from total operating costs. One example is land cost which is represented by its rental values. Land cost is the largest component of fixed costs, even though rent on land is fixed by the Government and through time has not been adjusted to keep up with the rising market value of land. Any such adjustment would change the level of fixed costs substantially.

Cost of Feeder Cattle

The average purchase price per head of feeder cattle was higher for public and food security feedlots, LE 428 and LE 424, respectively, than for private farms, LE 383 per head (table 14). The purchase price paid by private food security and public sector feedlots was LE 1.60, LE 1.75, and LE 1.82 per kg, respectively. The purchase prices both per kg of live weight and per head of feeder cattle was lower for smaller than for larger private feedlots. A variety of factors influence price of feeder cattle. Some of the more important factors include weight and condition of cattle entering feedlots, sex, and type of cattle.

A reason that private feedlots have lower purchase prices is that some of the smaller private operations produce their own feeder cattle. These farmers may have tended to report purchase prices lower than the market price (the

3/ A detailed paper explaining fixed cost estimation procedure was prepared by the staff of the livestock project of the Ministry of Agriculture and is available in Arabic.

Table 12--Components of cost by governorate, private feedlots

Governorate	Bedding		Labor		Insurance		Veterinary		Other	
	Per head	: Per kg of gain	Per head	: Per kg of gain	Per head	: Per kg of gain	Per head	: Per kg of gain	Per head	: Per kg of gain
	<u>LE</u>									
Beheira	6.49	0.04	31.74	0.22	3.33	0.02	4.80	0.03	4.77	0.03
Ismaelyea	5.91	.04	49.00	.29	2.01	.01	3.72	.02	2.98	.02
Kafr El-Sheikh	4.34	.03	52.09	.31	1.74	.01	2.13	.01	3.81	.02
Daquahia	13.09	.06	30.10	.14	1.95	.01	3.56	.02	4.65	.02
Sharquea	10.39	.06	46.81	.25	3.01	.02	3.98	.02	2.94	.02
Menoufyea	10.53	.06	49.96	.25	2.63	.01	4.95	.02	5.10	.02
Giza	11.92	.06	62.32	.35	1.87	.01	4.01	.02	2.34	.01

Table 13--Components of cost by management system and size

Management system and size	Bedding		Labor		Insurance		Veterinary		Other	
	Per head	: Per kg of gain	Per Head	: Per kg of gain	Per head	: Per kg of gain	Per head	: Per kg of gain	Per head	: Per kg of gain
	<u>LE</u>									
Private:										
1-3 head	13.27	0.07	50.20	0.27	2.11	0.01	2.97	0.02	3.23	0.02
4-6 head	10.62	.06	41.69	.24	2.55	.01	4.22	.02	4.00	.02
7-10 head	7.67	.04	39.44	.23	2.65	.02	3.77	.02	4.61	.03
11-20 head	4.40	.03	29.52	.18	2.90	.02	3.84	.03	4.29	.03
21-30 head	10.60	.07	36.54	.20	2.84	.02	7.27	.04	3.31	.02
31-50 head	8.33	.05	23.63	.14	2.84	.02	7.25	.04	3.31	.31
More than 50	4.59	.03	22.20	.13	2.75	.02	3.94	.02	4.60	.03
Average	9.38	.05	39.86	.23	2.55	.02	3.97	.02	4.03	.02
Public sector	1.84	.01	15.75	.05	0	0	6.47	.02	5.75	.02
Food security	.98	.01	10.88	.08	2.28	.01	3.49	.02	1.62	.01

Table 14--Values of livestock entering feedlot and marketed

Management system and governorate	Value per kg liveweight		Value per head		Gross margin	
	Entering feedlot	Marketed	Entering feedlot	Marketed	Per head	Per kg
<u>LE</u>						
Private:						
Beheira	1.56	1.87	442	809	367	0.85
Ismaelyea	1.81	1.83	370	704	334	.87
Kafr El-Sheikh	1.45	1.46	310	562	252	.66
Daquahlea	1.99	1.68	343	724	381	.88
Sharquea	1.55	1.67	368	717	349	.80
Menoufyeya	1.99	1.84	477	810	333	.75
Giza	1.78	1.84	388	731	343	.86
Average	1.60	1.75	383	737	354	.84
Public sector	1.82	1.23	428	650	222	.42
Food security	1.75	1.65	424	678	254	.62

opportunity cost to the feedlot). Another reason is that private farms purchase smaller numbers of animals at one time, and they usually purchase from smaller markets where they are able to bargain effectively for a lower price. Some observers argue that public and food security feedlots buy in large enough quantities to force up prices on the local market when they are present. The average price paid for feeder cattle ranged from LE 1.45 in Kafr El-Sheikh to LE 1.99 in Menoufyea and Daquahlea.

REVENUE

The general practice of livestock marketing (for both small and large producers) is to sell live animals in local markets, either to brokers or to large butchers. Brokers usually resell animals to small butchers. Only seven sample feed lots (2 percent) reported feeder cattle slaughtered and sold on farm. Live cattle marketing accounted for 97 percent of gross revenue for private feed lots, 98 percent for public feedlots, and almost 100 percent for food security feedlots (tables 15 and 16). Value of manure per head sold was higher in private feedlots, LE 13 representing 2 percent of total revenue. Fourteen farmers reported sales of cull animals, contributing less than 1 percent to total revenue of private lots. Sale of cull cattle provided less than 1 percent of revenue of public and food security lots. Value of insurance payments, due to cattle mortality, was less than 1 percent of total revenue for all farms in the sample. Interviews of farmers revealed that mortality in feedlots is less than 1 percent, which explains the low levels of refunded insurance values.

Selling Prices

Selling prices averaged 10 to 20 percent higher in private and food security lots (depending on the region) than for public sector lots. The lower selling prices of public farms is because of government policy. Public farms are required to sell the cattle to the Ministry of Supply at a fixed ceiling price set by the Government to be distributed through the main Government retail outlets. If the public feedlot financial records show heavy losses, companies are allowed to sell part of their livestock at higher prices in the private market. Prices of fed cattle (per head and per kg) sold by private feedlots were higher for larger feedlots than for smaller ones. One possible reason is the stronger bargaining power of the larger feedlots at retail level, because they are a more reliable source of meat production. And, larger private farms also sell animals which are in better condition in terms of health and appearance, and thus worth more in the market.

Revenue per head varied significantly among regions due to factors such as weight and type of animal, price difference due to size of feedlot (large farms appear to have more market power), and distance from major retail markets. The range in average revenue per head was from LE 562 in Kafr El-Sheikh to LE 810 in Menoufyea. Sales of live animals contributed 96 to 100 percent of the revenues depending on region. The range in price per kg of marketed live animals was from LE 1.38 in Kafr El-Sheikh to LE 1.83 in Menoufyea. Part of the price differential could be the result of variations in finishing weights. In Kafr El-Sheikh, the finishing weight of cattle was lowest at 384 kg; in Menoufyea, the finished weight was highest at 440 kg.

Higher weight is usually seen as relatively higher grade, meaning higher per unit price for heavier animals. Of course, other factors could also play an

Table 16--Components of feedlot revenue by management system and size

Management system and size	Live animal sold			Insurance received			Manure sold			Others		
	Per head	Per kg	marketed	Per head	Per kg	marketed	Per head	Per kg	marketed	Per head	Per kg	marketed
<u>LE</u>												
Private:												
1-3 head	673	1.65	0	0	0	0	15	0.04	0	0	0	0
4-6 head	715	1.69	0.5	0	0	0	13	.03	1	0	0	0
7-10 head	719	1.70	.2	0	0	0	14	.03	6	.01	.01	.01
11-20 head	720	1.69	0	0	0	0	11	.03	41	.09	.09	.09
21-30 head	775	1.82	0	0	0	0	15	.04	11	.03	.03	.03
31-50 head	819	1.78	0	0	0	0	17	.04	0	0	0	0
More than 50	753	1.70	.34	0	0	0	9	.02	39	.07	.07	.07
Average	714	1.69	.20	0	0	0	13	.03	9	.02	.02	.02
Public sector	638	1.22	0	0	0	0	7	.01	5	0	0	0
Food security	676	1.65	1.23	0	0	0	1	0	.2	0	0	0
Average	712	1.68	.20	0	0	0	13	.03	3	.01	.01	.01

important role. For example, most Kafr El-Sheikh feedlots were smallholders, with fewer than 10 head per farm. These smallholders are expected to have less marketing power, leading to a lower per unit sale price. One important factor is the regional variation in supply and demand for meat. Given the imperfect nature of the market in terms of information availability and transportation costs, relatively higher demand than supply in one region could significantly increase the prices at least in the short term.

Small producers sell their livestock in local markets, which are mostly nonspecialized and small. Buyers in these markets transport the cattle to slaughterhouses usually located in larger towns and cities. All animals, according to Egyptian law, have to be slaughtered in official slaughterhouses. However, there are reports that as many as 40 percent of animals are slaughtered outside official channels. Larger producers are, in general, known to buyers, either butchers or brokers, and sometimes transactions take place at their feedlots without going through the market.

Gross Margin

The lower prices paid and higher prices received for cattle put private feedlots in a relatively more favorable position in terms of gross margins, both per head and per kilogram of marketed beef. The cost of feeder cattle, as a proportion of total revenue, ranged from 52 percent for private lots to 66 percent for public lots (table 17). The average gross margin per kg of live animal marketed was LE 0.84 for private lots compared with LE 0.42 for public lots and LE 0.62 for food security lots. The low gross margin for public lots is because of the low selling prices set by the Government. Gross margins for food security lots were lower than for private lots because of higher purchase price and lower revenue per kg of marketed livestock. The finishing weight of animals was lowest for food security farms, 410 kg versus 529 kg in public lots and 422 kg in private lots. Lighter finishing weight often means lower grade and lower price in the market. However, private lots, marketing at relatively light weights, received the highest price.

Gross margins varied among regions and sizes of feedlot operation as well. Regional selling and purchasing price differences, possibly due to the degree of accessibility of farmers to the main trading markets, were a major factor causing regional differences in gross margins.

Among private feedlots, smaller lots tended to have higher gross margins than larger lots. Purchasing prices paid for feeder cattle were lowest for small farms. Larger feedlots, although receiving higher return per kg of live weight marketed received lower gross margins because their higher purchasing prices of feeder cattle more than offset their selling price advantage.

Net Return

The average net return (return to the fixed costs and management or revenue minus operating cost) for private feedlots was LE 150 per head, or about LE 0.84 per kg of weight gain (tables 18 and 19). Returns for food security farms were higher (LE 171 per head or LE .98 per kg of gain). Net return to public farms was lowest, at LE 99 per head or LE 0.38 per kg of gain. If the opportunity costs associated with working capital (12 percent rate of interest) are added to operating costs, the net return will decline to about LE 0.43, 0.62, and 0.14 per kg of gain for private, food security, and public feedlots, respectively.

Table 17--Gross margin by management system and size

Management system and size	Purchase price		Revenue		Gross margin	
	Per head	Per kg	Per head	Per kg	Per head	Per kg
	: marketed	: marketed	: marketed	: marketed	: marketed	: marketed
<u>LE</u>						
Private:						
1-3 head	337	0.82	688	1.69	351	0.87
4-6 head	372	.88	730	1.73	358	.85
7-10 head	393	.93	739	1.74	345	.81
11-20 head	419	.98	772	1.81	353	.83
21-30 head	448	1.05	801	1.89	353	.84
31-50 head	454	.99	836	1.82	382	.83
More than 50	448	1.01	794	1.79	346	.78
Average	383	.91	737	1.75	354	.84
Public sector	428	.81	650	1.23	222	.42
Food security	424	1.03	678	1.65	254	.62

There were significant variations in net returns within each type of feedlot, among regions, and sizes of operation. Of the 297 private farms, 21 (7 percent) had negative net returns, with a range in average loss per head of LE 4 to LE 161. Other farmers covered more than their variable costs with net returns as high as LE 400 per head. Net return for most of the private farmers was in the range of LE 100-200 per head. Seventeen farms reported net returns higher than LE 300 per head, and 58 farms reported net returns of less than LE 100 per head.

Regional variations in net returns are due to variations in specific costs and revenue items (table 18). The average net return was almost 3 times greater in Beheira (LE 0.99 per kg of gain) than in Kafr El-Sheikh (LE 0.36 per kg of gain). The apparent reason for such a variation is the selling price (or revenue) per head which was LE 808 in Beheira and LE 562 in Kafr El-Sheikh, a difference of LE 246. The average selling weight of cattle in Beheira was 44 kg more than in Kafr El-Sheikh, and the average revenue per kg liveweight marketed was LE 1.6 versus LE 1.5, respectively.

Economies of size generally reflect the relationship between feedlot size and total fixed costs. With the exception of public lots, fixed costs have not been treated in this study. Thus, size-related differences in net return are due to either differences in variable costs or selling price. Variable costs could differ because of managerial decisions on factors such as type of ration, type of cattle placed on feed, length of time on feed, purchase weight, selling weight, etc. The combined effect of management decisions resulted in higher net return per head for feedlots of larger size, 10 head or more (table 19). The only exception was for the size group 21-30 head. The smallest feedlots, with 1-6 head, had lower than average variable costs, but the lower costs was offset by lower returns, resulting in a slightly higher than average net return, LE 156 per head versus LE 150 for the average private farms. Most of the small farmers place their own cattle on feed at a younger age (low weight) which results in a substantial savings on feed costs as daily rates of gain were higher and feed cost per kg of gain were lower. Variable costs generally increased with size of holdings; but larger farms, because of their stronger marketing position, earned higher revenues both per head and unit of gain.

Two the four public feedlot projects showed a loss of LE 34 and LE 113 per head, reflecting the higher price paid for feeders, the low price received for fed animals, and high variable cost. These projects have large capital investments in fixed facilities, especially in land, which tends to result in high levels of annual fixed costs, representing 5 to 7 percent of their total feeding costs. Since the degree of utilization was relatively low, inclusion of costs of fixed facilities in the calculation would cause substantial loss. In these feedlots, facilities are used only for one cycle of production, which is about 7 months. With the low marketing prices set by the Government, losses seem inevitable. However, the other two public projects had net returns higher than the average for all producers in the sample, about LE 270 per head or LE 0.92 per kg of gain. When fixed costs are added, their net return declines by 12 percent to LE 237, which is still significantly higher than LE 150 per head for the entire sample. A combination of factors—lower purchase price of feeder cattle (3 percent lower than average), lower operating costs (30 percent lower than average), and almost equal to average price for marketed cattle—led to a sizable net return for these feedlots. The wide range in net return among public feedlots indicates that they can be efficient

Table 19---Feedlot budget by management system and size

Management system: and size	Purchase price		Operating costs		Revenue		Variable costs		Net return	
	Per head	Per kg of gain:	Per head	Per kg of gain	Per head	Per kg of gain	Per head	Per kg of gain	Per head	Per kg of gain
	£	£	£	£	£	£	£	£	£	£
<u>LE</u>										
Private:										
1-3 head	337.09	1.01	193.98	1.03	688.03	3.65	531.07	2.84	156.96	0.81
4-6 head	372.13	2.10	201.61	1.14	730.32	4.07	573.74	3.24	156.58	.83
7-10 head	392.84	2.39	222.47	1.34	738.36	4.45	615.30	3.73	123.05	.72
11-20 head	419.11	2.69	191.85	1.25	771.59	4.96	610.96	3.94	160.63	1.02
21-30 head	447.87	2.69	215.26	1.29	801.26	4.75	663.13	3.98	138.13	.76
31-50 head	454.04	2.60	211.67	1.21	835.75	4.85	665.71	3.81	170.04	1.04
More than 50	448.38	2.73	183.03	.98	793.81	4.84	631.41	3.71	162.40	1.01
Average	383.33	2.24	203.02	1.18	736.45	4.26	586.35	3.42	150.10	.84
Public sector	428.36	1.56	122.93	.42	650.05	2.36	551.28	1.98	98.77	.38
Food security	423.96	2.51	83.49	.52	678.29	4.01	507.45	3.03	170.84	.98

and profitable if allowed to sell at market price, but that some are very inefficiently operated.

The net return in the most profitable food security lot (LE 268 per head) was more than four times that of the least profitable (LE 64 per head). The low rate of net return of LE 64 was because of the low selling price of cattle, average of about LE 1.4 per kg of liveweight, substantially lower than the average price of LE 1.76 per kg of marketed price. In this special case, the type of animal fed was crossbreeds, the finishing weight was 350 kg (lower than average), and weight gain was 150 kg over 6 months. A combination of less than average daily weight gain and marketed weight seems to be the reason for low marketed price and low net return, both per head and per unit of gain.

MANAGEMENT PRACTICE AND COST OF PRODUCTION

Differences in farm management decisions and farm planning are expected to change costs and returns of an enterprise. In Egypt, questions have been raised concerning how variations in management practices affect returns and costs of feedlots. Decisions on type of feed rations, types of animal, and weight of animals entering and leaving feedlots are expected to offset costs and returns of the feedlot operators.

Effect of Different Feed Rations on Production Costs

Efficiency in the feedlot operation, as in other business activities, depends on such things as up-to-the-minute knowledge of the costs of inputs, and the effect of such inputs on overall production costs. Feed cost is a major component of operating costs. Any change in ingredients and prices can significantly change costs and net returns. In Egypt, growing and finishing beef with feed concentrates is a common practice. As a supplement to feed concentrates, farmers use either roughage only, or a combination of roughage and green forage. The latter type of feed ration was used in 94 farms, roughly one-third of the observations. Feed concentrate is produced by the Government, and distribution is based on a fixed quota per head of cattle placed on feed--5 kg per day for 6 months in 1983. If the distributed feed is inadequate, additional quantities can be purchased on the black market at prices up to six times the official price (LE 30 per ton versus LE 180 per ton).

Feed cost per kg of gain for private feed lots was lower when green forage was fed than when it was excluded from the feed ration (table 20). In contrast, for food security and public lots, feed costs were lower for farms using feed concentrate and roughages, by a margin of LE 0.06 (food security lots) and LE 0.19 (public lots) per kg of gain. Green forage was used in two of four public farms and four of seven food security farms.

On private farms, only 50 percent of the larger lots (30 head or more) are fed green forage. The larger farms are expected to have easier access to feed concentrate, which is the least costly way of producing beef because of the Government's feed subsidy policy. The Government's quota system for distributing the concentrate feed mix follows a specific list of priorities which gives precedence to state farms and large farms which have contracts to deliver meat to public sector companies. On smaller farms (fewer than 10 head per lot) it was cheaper to feed green forage as a part of the feed ration, reducing costs by almost LE 0.16 per kg of weight gain. Thus, 85 percent of smaller lots included green forage in the ration fed. The possible

explanation for the higher feed costs incurred by small farms when only roughage and concentrate are fed is the inadequacy of the quota of feed concentrates. In these cases, some part of concentrates fed would have to be purchased in the black market at much higher prices.

The effects of the two types of feed ration on feed costs per head and per kg of gain in different governorates are presented in table 21. There were significant variations in feed costs using the two types of rations. For example, Ismaelyea costs of the green forage ration were about half those of the nongreen-forage ration--LE 0.63 versus LE 1.17 per unit of gain. Exclusion of green forage from the ration led to lower cost per unit of gain in four of six regions. Exceptions were Ismaelyea and Kafr El-Sheikh. However, the differences in costs were not very large, being in the range of LE 0.04 to LE 0.16 per kg of gain.

Effect of Differences in Weight of Feeder Cattle on Production Costs

Differences in the weight of animals entering feedlots could significantly change the operating costs of the farmers. The purchasing price of livestock in general is 63 to 80 percent of the total variable costs. Heavier feeder cattle require higher investment costs, give lower feed conversion rates, and have higher daily feed consumption rates. However, with the same period on feed, heavier feeder animals often finish out at relatively higher grades and often sell at a higher price than do lighter feeder cattle.

There is a wide range in weights of cattle placed in feedlots in Egypt. Average weights of cattle entering feedlots ranged from 130 kg to 325 kg. In 73 percent of the farms, the entering weights in the ranged from 200 kg to 300 kg. Feeder cattle weighing between 200 to 250 kg were placed by 45 percent of the farms. Entering weight of cattle was less than 200 kg in 12 percent of farms, and feeder cattle heavier than 300 kg were placed in 15 percent of the feedlots.

Table 22 shows costs and returns to the feedlots by weights of livestock entering feedlots and management systems. With the exception of public lots, whose selling prices are regulated, the net return generally increased with increasing weight of animals entering feedlots. The reason is that heavier entering weight corresponded to heavier finishing weight and the higher selling price per kg of gain for heavier animals, which more than offset the higher operating costs and purchasing prices.

Comparison of the budgets of different management systems indicate that net return was higher for private farms than food security lots when feeder cattle had lighter weight (less than 200 kg), LE 0.82 per kg of gain compared with LE 0.43. This relation was reversed when heavier feeder cattle (200 to 300 kg) were placed in feedlots. Differences in feed cost was the main reason for the lower net return to private farms. The average feed cost per unit of gain was 45 to 50 percent higher in private lots than in food security lots.

The average weight of steers entering feedlots in the United States ranges from 270 kg to 320 kg, compared with the 240 kg average entering weight of cattle in Egypt. In more than 60 percent of the farms, the weight of feeder cattle placed on lots was less than 250 kg. Since the general feeding period is about 6 months, the low weight of animals entering feedlots means lower finishing weights and consequently less meat marketed.

Table 20--Feed cost using different types of ration
by management system and size

Management system and size	Feed ration with green forage		Feed ration without green forage	
	Per head	Per kg of gain	Per head	Per kg of gain
	:	:	:	:
	<u>LE</u>			
Private:				
1-3	122	0.66	124	0.67
4-6	135	.73	148	.92
7-10	161	.97	177	1.13
11-20	153	1.02	142	.93
21-30	142	.94	176	.97
31-50	178	.96	150	.93
More than 50	128	.67	95	.60
Average	142	.81	147	.91
Food security	103	.44	64	.35
Public sector	86	.43	48	.24
Average	140	.80	142	.88

Table 21--Feed costs of different types of ration by governorate

Governorate	Feed ration with green forage		Feed ration without green forage	
	Per head	Per kg of gain	Per head	Per kg of gain
	:	:	:	:
	<u>LE</u>			
Beheira	187	1.36	161	1.11
Ismaelyea	118	.63	185	1.17
Kafr El-Sheikh	126	.74	119	.79
Daquahlea	133	.63	123	.56
Sharquea	124	.67	99	.51
Menoufyea	174	.82	124	.73
Giza	142	.84	163	.80

Effect of Animal Breed on Production Costs

The Egyptian Government is looking for options to increase meat availability. One way is to establish more feedlots. However, unpublished reports indicate shortages of feeder cattle, explaining part of the current low feedlot utilization rates. The Government has recently increased the number of live

Table 22--Revenue and cost by different weight of feeder cattle entering feedlots

Revenue and cost by category	Private		Public sector		Food security	
	Per head	Per kg of gain	Per head	Per kg of gain	Per head	Per kg of gain
			<u>LE</u>			
Weight less than 200 kg:						
Purchase price	328	1.87	--	--	350	2.33
Feed cost	118	.67	--	--	59	.39
Other costs	68	.40	--	--	19	.13
Revenue	666	3.76	--	--	492	3.28
Net return	152	.82	--	--	64	.43
Weight 200-249 kg:						
Purchase price	356	1.85	320	1.07	408	2.06
Feed cost	132	.69	93	.31	71	.34
Other costs	60	.30	38	.13	14	.08
Revenue	708	3.64	647	2.16	687	3.42
Net return	160	.80	196	.65	194	.94
Weight 250-299 kg:						
Purchase price	413	2.51	465	1.64	451	3.11
Feed cost	153	.93	93	.32	62	.42
Other costs	65	.39	27	.09	22	.15
Revenue	776	4.71	651	2.21	721	4.88
Net return	145	.88	66	.16	186	1.20
Weight 300 kg or more:						
Purchase price	466	3.28	--	--	--	--
Feed cost	19	1.30	--	--	--	--
Revenue	964	6.90	--	--	--	--
Net return	276	2.03	--	--	--	--

-- = Not applicable

animal imports, mainly for direct slaughter after a short feeding period of 30-45 days. Only about 10 percent of the imported feeder cattle are placed in feedlots. Imported livestock are also used for breeding purposes since the crossbreed animals are expected to finish with a higher weight than local breeds. The survey data indicate that the number of farms feeding foreign and crossbreeds is limited, less than 7 percent of the total observations. Two public lots specialized in fattening foreign breeds, and in one a mixture of cross and local breeds were fed. In food security lots, with the exception of one farm feeding crossbreeds, only local breeds were placed on feedlots.

Costs and returns for the feedlots by different breeds are shown in table 23. Although there were some differences in operating costs associated with type of animal for the different management systems, differences in net returns were mainly due to the larger variations in purchasing prices of feeder cattle and selling prices. In private feedlots, purchase prices per head for local breeds were less than for cross and foreign breeds, partly because of the differences in the weight of animals entering feedlots. Average entering weight for local breeds was 233 kg, while for crossbreeds and foreign breeds these were 279 kg and 236 kg, respectively. The unit purchase price for feeder cattle was highest for foreign breeds (LE 1.76 per kg of live weight) while the average purchase price for local and crossbreeds was LE 1.63 per kg. The other cost items varied somewhat, but the major determinant of net return (per head and per kg of gain) was market price of fed cattle. The selling price per head and per unit of gain in private lots was lowest for foreign breeds and highest for crossbreeds.

The net return to the food security farms feeding local breeds was significantly higher than to the farms feeding crossbreeds--60 percent higher per kg of gain. In public feedlots, the two larger projects (each having more than 1,000 head) specialized in feeding foreign breeds had a net loss of LE 0.74 per head or LE 0.27 per kg of gain. In these two projects, the average purchase price of feeder cattle was significantly higher than in the other two lots (which showed positive net returns) and the revenues were lower, without much variation in their operating costs.

In summary, returns to local breed and crossbreeds varied among different management systems, but returns were generally lower for foreign breeds. These results are inconsistent with the research findings which indicate more rapid weight gain by foreign breeds. However, two important points have to be remembered: first, the depressed selling prices set by the Government for the public lots, the major feeder of foreign breeds, and second, the findings cannot be widely generalized, because of the limited number of farms feeding foreign and crossbreeds, especially when they are classified by management systems.

ECONOMIC COSTS OF FEEDLOT OPERATIONS

Costs and returns are calculated based on current market regulations (that is, subsidized price for concentrated feed rental value of land fixed by the Government at less than prevailing market rent, and lower than market price for the livestock sold by public farms). Removing or changing government regulations would substantially change the relative costs and returns to the different types of producers to the extent that they were affected differently by regulations.

Table 23--Revenue and cost by different types of cattle

Type of cattle	Private		Food security		Public	
	Per head	:Per kg of gain:	Per head	:Per kg of gain:	Per head	:Per kg of gain:
<u>LE</u>						
Domestic breeds:						
Purchase price	380	2.23	436	2.76	325	1.02
Feed cost	143	.84	65	.39	97	.31
Other costs	60	.34	19	.14	39	.12
Revenue	756	4.42	709	4.40	733	2.29
Net return	173	1.01	189	1.11	272	.84
Crossbreeds:						
Purchase price	455	2.57	350	2.33	350	1.30
Feed cost	134	.77	59	.39	101	.37
Other cost	51	.29	19	.13	41	.15
Revenue	823	4.66	492	3.28	819	3.03
Net return	183	1.03	64	.43	348	1.21
Foreign breeds:						
Purchase price	415	2.22	--	--	532	1.97
Feed cost	172	.88	--	--	89	.33
Other costs	52	.28	--	--	20	.07
Revenue	675	3.64	--	--	567	2.10
Net return	36	.26	--	--	-74	-.27

-- = Not applicable

Reviewing government policy objectives reveals two somewhat conflicting goals: (1) reducing government spending, and (2) limiting increases in meat prices and stimulating domestic production through feed subsidies. The feed subsidy policy has been the subject of much public debate. Concentrated feed mix was sold at LE 30 per ton, while the equivalent international price was LE 135 in 1982, almost 4.5 times the domestic price. According to this study, the major beneficiaries of the feed subsidy program are public, food security, and to a lesser extent large private farms. Feed concentrate is the major component of the feed rations in these types of operations. In public and food security lots, costs of feed concentrate are about 56 and 51 percent of total feed costs, respectively. In private lots, feed concentrate is about 40 percent of total feed expenditure. Differences result from greater use of forage and roughage as supplemental feed and the purchase of varying proportions of concentrate on the black market by private feed lots. Private farm costs per kg of weight gain are about two times higher than those of public farms (LE 0.34 versus LE 0.18). Prices paid by private lots for feed concentrate are closer to the market value of the feed concentrate because part of their unmet demand is channeled to the black market. If the Government were to remove the feed price subsidy, an increase of 450 percent in feed price for the public sector (assuming no substitution among different types of feed) would increase their feed concentrate costs from LE 0.18 per kg of weight gain to LE 0.81 per kg, and their total feed costs from LE 0.32 to LE 0.95. Of course, given the price cap set by the Government on the sale price of cattle in public lots, their financial balance would show a significant decline.

With removal of the sale price ceiling from public lots, however, the increase in return could be significant. If the price per kg sold by public lots were increased to the level of the private lots (from LE 1.23 to LE 1.75, see table 17) even with the increase in total variable costs from LE 1.98 to LE 2.61 per kg of gain (due to removal of the feed subsidy), the net return would increase by 46 percent to LE 0.57 per kg of gain, assuming no change in other costs (table 24).

Removal of the feed subsidy would lead to a smaller increase in feed costs for the private sector than for the public sector lots because concentrate feed constitutes a smaller proportion of total feed cost and some portion of private sector purchase of concentrate already occurs at the black market price. If the feed concentrate costs of private lots increase to the same level of public lots, that is, the same price per kg fed, their average concentrate feed costs will increase from LE 0.34 to 0.64, and their net return will be reduced by 36 percent to LE 0.54 per unit of gain. Of the 297 private farms, 58 farms (20 percent) will have a negative net return. They will not be able to cover their variable costs, an increase of 13 percent compared with the current situation.

In food security lots, when the same type of adjustments in selling and feed costs are made, the net return will decline by 33 percent to LE 0.66 per kg of gain, placing them first in terms of net return among different management systems. And, as table 24 shows, after policy adjustments the large apparent differences in net return to different types of operations would be reduced significantly. A change in feed policy away from subsidy and a more even distribution of feed concentrates among different types of operations is expected to change the mix of feed consumption. Consequently, the estimated large differences in feed costs among different management systems (private lots pay 2.5 times more than public lots) is expected to be reduced, which

means higher net return for private lots than the LE 0.54 per kg of gain calculated in table 24.

Any change in government policies is expected to significantly change the profitability of the feedlot operations and the structure of the industry. For example, removal of the price cap from public lots means higher purchased meat prices for another government agency "The Meat Company," which purchases meat from public lots, and sells to the cooperative shops at the retail level. At these shops, fresh red meat, although not always available, is sold at about 40 percent below free market prices. Government is attempting to provide fresh meat as an alternative to frozen meat, the quality of which has been subject of frequent public debate.

Further research on the questions of feed use and feed policy options, currently being concluded jointly by USDA and the Egyptian Ministry of Agriculture, will allow a deeper understanding of the issues involved in the management and planning of feed subsidies. The followup research will consider likely effects of modifying subsidy programs including changes in ration and will evaluate alternative approaches the Government might take to close the red meat gap.

Table 24-Economic costs by management system

Item	Private		Public		Food security	
	Current	Policy	Current	Policy	Current	Policy
	Policy	change	policy	change	policy	change
	1/		2/			
LE per kg of gain						
Revenue	4.26	4.26	2.19	3.18	4.01	4.24
Purchase price	2.24	2.24	1.56	1.56	2.51	2.51
Feed costs:						
Green forage	.15	.15	.04	.04	.03	.03
Roughage	.35	.35	.10	.10	.16	.16
Feed concentrate	.34	.64	.18	.81	.20	.75
Subtotal	.84	1.14	.32	.95	.39	.94
Other costs	.34	.34	.10	.10	.13	.13
Operating costs	1.18	1.48	.42	1.05	.52	1.07
Variable costs	3.42	3.72	1.98	2.61	3.03	3.58
Net return	.84	.54	.39	.57	.98	.66

1/ Feed concentrate price is increased to its international level.

2/ Marketed value is increased to the level of average private revenue and feed concentrate price is adjusted to the international level.

SUMMARY

There are significant differences in operational characteristics, costs, and returns among regions, different sizes of operation, and management systems. The main feature of the feedlots is the small size of operations; about 74 percent of the total observations had fewer than 10 head per farm. The period of feeding is usually 180 days (91 percent of sample), ranging from 120 days to 240 days. The degree of feedlot utilization is low, less than 70 percent of capacity calculated in terms of one cycle of production per year. The most probable reasons for the low rate of feedlot utilization are shortages of feed and feeder cattle. Local breeds of animals are usually fed by private and food security farms (93 percent of farms). Two larger public projects (more than 1,000 head in each lot) were specialized in feeding foreign breeds. The other two smaller public operations, fewer than 600 head, fed local and crossbreeds.

The essential ingredient of the feed ration is concentrated mix, produced and distributed by the Government at a subsidized price. Additional components of the feed ration are green forage (mainly berseem) and/or roughages. Composition of feed ration varied among regions and management system (type of ownership).

Weight gain per day for local breeds was lower than for foreign and crossbreeds. The average daily gain for foreign and crossbreeds are comparable with the daily gain for steers in the United States. However the finishing weights of livestock in Egypt are generally lower than the U.S. average by 10 to 15 percent, because of the lower weights entering the feedlot and slower growth for local breeds.

Analysis of feedlot costs focused on variable costs under the existing policy regulations. Lack of standardized bookkeeping was the major obstacle in interpretation of fixed costs, especially for private farms. However, because of the government concern over economic efficiency of public farm operations, fixed costs were calculated for public lots only. Cost and revenue data were calculated on the basis of per head and per unit of gain, and were summarized by region, size of operation, and management system.

The return to average producers covers variable costs and leaves a significant margin as return to fixed factors and management, especially in private and food security lots (LE 150 per head (0.84 per kg of gain) and LE 171 (.98 per kg of gain), respectively. Public lots, because of governmental regulations on selling prices, are in a less favorable economic condition, with a net return of LE 99 per head or LE 0.38 per unit of gain. If the fixed cost for public lots is added to the total variable costs (LE 7-9 per head), return to management will decrease by 10 percent. Analysis of economies of size revealed that gross return, which is the difference between purchasing and selling prices, was higher for smaller farms, mainly because they were able to either buy feeder cattle at lower price or feed their own feeder cattle. Purchase cost of feeder cattle accounted for 63 to 80 percent of variable costs for private sector feedlot, depending on region, size of operation, and management system. Operating costs (feed plus other variable costs) were significantly higher in private lots, more than two times those of public and food security lots, mainly because of the higher feed prices in the black market. The average feed cost per head for private lots was LE 143, LE 93 in public farms, and LE 64 in food security lots, representing 70 to 77 percent of the total operating costs.

Differences in the composition of the feed ration were found to affect feed costs. On private farms, when green forage was added to the feed ration, cost per unit of gain decreased by 11 percent. On food security and public farms, feed rations containing concentrated mix and roughage, but excluding green forage, reduced feed costs by 40 to 45 percent. Increase in weight of feeder cattle entering feedlots, generally led to higher finishing weights and higher per unit revenues. Higher selling prices for heavier animals resulted in higher net returns to farmers. The farms feeding local and crossbreed animals showed higher returns than those feeding foreign breeds.

Any changes in government policy, will change the profitability of the feed lot operations. The impact of removal of feed price subsidy would result in a 300 percent increase in cost per kg gain in public lots. If removal is combined with the lifting of the price cap on the sale price of public feedlots, the combined effect would be an increase of 46 percent in return to public lots. Removal of feed price subsidy showed a smaller increase in feed costs for private lots than public lots, because feed concentrates are a smaller share of the ration fed in private lots. Increasing the price of feed concentrate to its international level reduced return to private lots by 36 percent, with 20 percent of the farmers not being able to cover their variable costs. Any changes in feed subsidy policy will change the ration feed. Therefore, the differences in feed costs estimated in this study (table 24) would be reduced, meaning more consumption of concentrate feed, higher weight gain, and consequently higher return to private operations.

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